

Biomarker tells of tongue cancer spread

Researchers Amit Dutt, left, and Sudhir Nair of the Tata Memorial Centre.

Researchers at the Tata Memorial Centre in Mumbai have identified a biomarker that will help doctors decide whether patients with early-stage tongue cancer should undergo neck surgery to remove 20-30 lymph nodes. Patients negative for the biomarker can be spared of neck dissection.

Studies were carried out on 57 patients. In nearly 70% of patients with early-stage tongue cancer, the tumour does not spread to the lymph nodes.

But in the absence of a reliable biomarker capable of pointing out in which patients the disease will recur, doctors routinely remove the affected part of the tongue and the lymph nodes in all patients with early-stage tongue cancer.

Nearly 80% of patients survive and are disease-free if tongue cancer is detected early. But once cancer spreads to the lymph nodes, the survival rate reduces to 40%.

"Currently, surgical removal of lymph nodes and studying them is the only way of knowing if the cancer has spread," says Dr. Sudhir Nair from the division of head and neck oncology at the Tata Memorial Centre and one of the authors of the paper.

"The discovery of the biomarker — MMP10 protein — potentially fills this gap. Only those patients who have higher level of this protein [overexpression] are likely to have cancer spread to the lymph nodes. So the biomarker will help doctors to decide which patients could be spared of complex surgeries to remove the lymph nodes," says Dr. Amit Dutt from the integrated genomics laboratory at the Tata Memorial Centre and the leader of the research team. The results were published in the journal *Oral Oncology*.

The biomarker can be identified using a simple immuno histochemical analysis, a method to locate proteins in tissue sections.

The researchers validated their findings using data of 253 patients from the Cancer Genome Atlas and other studies.

"The MMP10 biomarker was significantly higher in four of the five data sets," Dr. Dutt says. "We will be further validating our finding using 500 samples collected by our hospital during an earlier trial."

The 57 patients studied were negative for human papillomavirus (HPV) but were habitual users of chewing tobacco.

Although chewing tobacco has been associated with oral cancer, there has been no direct evidence linking the two at the genome level. This study has for the first time shown a direct link between chewing tobacco and tongue cancer.

Those chewing tobacco had a classic signature in the genome in the form of a specific type of mutation (transversion mutation). "In our study, 53% of all patients have this tobacco signature. This mutation is driven by tobacco usage," says Dr. Pawan Upadhyay, the first author of the study.

Lifestyle-related risk factors are being cited, compounded by an inadequate number of treatment centres in the region

Without policies to stop the worrying spread of antimicrobial resistance, the mortality rate could be disturbing

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